

Newsletter

May 2018

'Hygeia's Gift': scanning-electron micrograph of metallic foam.
Credit: Donghui Wang (Wuhan University, China).

Newsletter of the IEEE Magnetics Society

Volume 58 | Issue 2 | May 2018

Editor: Gareth Hatch



In this Issue:

- 1 **From the President** by Manuel Vázquez
- 1 **New Senior Members** by Gareth Hatch
- 2 **For the Record: IEEE Magnetics Society 2017 Distinguished Service Award** submitted by Ron Goldfarb
- 2 **ICM 2018 in San Francisco to Host Néel Medal Award Ceremony** submitted by Liesl Folks
- 3 **IEEE Magnetics Society Administrative Committee: Call for Nominations** by Bruce Terris
- 4 **UK & Ireland Chapter News** submitted by Nicola Morley and Paul Nutter
- 5 **INTERMAG 2018: Conference Report** by S. N. Piramanayagam
- 5 **INTERMAG 2018: Plenary Session** by Burkard Hillebrands
- 8 **INTERMAG 2018: Student Travel Grant Reports** submitted by Burkard Hillebrands
- 9 **INTERMAG 2018: Best Student Presentation Finalists** submitted by Burkard Hillebrands
- 9 **The Newsletter Gets a Makeover** by Gareth Hatch
- 10 **INTERMAG 2018: Art in Magnetism Contest** compiled by Gareth Hatch
- 11 **INTERMAG 2018: In Pictures** compiled by S. N. Piramanayagam and Gareth Hatch
- 15 **TMRC 2018 Registration Now Open** by Tiffany Santos
- 16 **Conference Calendar** by Gareth Hatch
- 16 **Forthcoming Revision of the International System of Units Will Affect Magnetics** by Ron Goldfarb
- 16 **About the Newsletter** by Gareth Hatch

From the President

By **Manuel Vázquez**, President of the IEEE Magnetics Society

The current issue of the Newsletter appears just a few weeks after the **INTERMAG 2018 Conference** was held in Singapore, during April 23-27, 2018. This Asian edition of the INTERMAG conference series was a great success from scientific, organizational, and participation points of view. In addition, it profited from being held in singular Singapore, an exciting hub full of multicultural character, with outstanding educational and technical achievements, an example for the emerging future.



I would like to express my congratulations and acknowledge the excellent work undertaken by the organizers, headed by S. N. ('Prem') Piramanayagam and Sara Majetich. The international team included Program co-Chairs Jingsheng Chen, Albrecht Jander, Shigeki Nakagawa and Johannes Paulides; Treasurers Mark Kief and Wen Siang Lew; Publication co-Chairs Petru Andrei and Dan Wei, and Local Chair Raju Ramanujan, among others. Further details of the Plenary Session and the Awards ceremony can be found in the report by Burkard Hillebrands, elsewhere in this issue of the Newsletter.

The IEEE Magnetics Society is co-sponsoring the next **International Conference of Magnetism (ICM2018)**, which after some time is coming back to the USA. It will be held in San Francisco, California during July 15-20, 2018. Conference Chair is Allan MacDonald and the Secretary General is Liesl Folks. Everything is firmly under control and we look forward to meeting you at ICM2018, likely a large conference on magnetism that attracts the highest participation from all over the world and for which we expect great success.

Over the next few months the Society is sponsoring several smaller conferences on magnetics, including the **2018 IEEE International Conference on Microwave Magnetics (ICMM2018)**, chaired by Robert Hicken and taking place at the University of Exeter, UK during June 24-27, 2018, and the **29th Magnetic Recording Conference (TMRC 2018)**, which takes place during August 8-10, 2018 in San Diego, California, USA, chaired by Kumar Srinivasan.

Although technically considered a small conference, the **IEEE Magnetics Society Summer School** is obviously devoted to promote educational activities. It will be held soon during June 3-8, 2018 at the Universidad San Francisco de Quito, Ecuador, and is being organized by Dario Niebieskikwiat.

I would like to mention the establishment of the new *IEEE Magnetics Society Conference Proceedings* in the IEEE Xplore Digital Library, headed by Petru Andrei and expected to accommodate the Society's publications to higher editorial and financial standards.

We are approaching summer in the Northern hemisphere, which is the time of year for nominations. Each year, the Society's Administrative Committee (AdCom) is renewed through the nominations process, leading to the selection of one third of the 24 elected members on the AdCom. This is the main forum for discussion on the most important activities of the IEEE Magnetics Society and where motions are considered.

By nominating people suitable to represent your interests on the AdCom, you contribute to promoting the broad diversity (in terms of gender, geography and academia/industry) that is desired when selecting the participants making decisions for the Society. Do not forget that the deadline for nominations to the AdCom is **June 15, 2018**. You can find more information on the AdCom nomination process elsewhere in this issue of the Newsletter, and on the Society's **Web site**.

In addition, you can contribute with nominations for IEEE Fellow (deadline **June 18, 2018**), for the Distinguished Lecturer program (deadline **July 1, 2018**), as well as for the Society Awards, namely the Achievement Award, Early Career Award and the Distinguished Service Award (deadline **July 31, 2018** for each of these). Please, go ahead and participate!

As in previous issues of the Newsletter, allow me to encourage you to advertise the general activities of the IEEE Magnetics Society, and to attract new colleagues to join us in the Society. If you are already a Society member, you are welcome to volunteer for the different activities of the Society. Please, contact the corresponding Chair or me directly, if you have a specific request.

New Senior Members

The following members of the IEEE Magnetics Society were recently elevated to the grade of Senior Member:

April 2018: Sorin Deaconu, Olaf Haedrich, Sushil Jain, Maciej Kuniewski, Nenad Mijatovic, Zygmunt Mikno, Enric Pardo, Stephen Russek and Klaus Schlenga.

For more information on elevation to Senior Member, visit the [IEEE Senior Member Grade Web page](#).

For the Record: IEEE Magnetics Society 2017 Distinguished Service Award

Submitted by Ron Goldfarb, Distinguished Service Award Chair

In 2016 the IEEE Magnetics Society Distinguished Service Award was established to honor outstanding service to the Society. Recipients are characterized by sustained voluntary service significantly beyond the typical. The award is presented at the INTERMAG Conference each year and consists of a certificate and a cash prize.

The recipient for 2017 was **Robert E. Fontana Jr.** of IBM Systems at the Almaden Research Center in San Jose, California, USA. He received the 2017 Distinguished Service Award *“for establishing the structure and enhancing the international impact of major technical conferences sponsored by the IEEE Magnetics Society.”*



Bob received the BS, MS, and PhD degrees, all in electrical engineering, from the Massachusetts Institute of Technology. His professional career has been with Texas Instruments, the IBM Research Division, Hitachi Global Storage Technologies, and, since 2008, IBM Systems. His research has centered on developing and implementing processing strategies for magnetic recording thin-film head transducers (anisotropic, giant, and tunneling magneto-resistive sensors) into manufacturing environments. Currently, his technical work concentrates on advanced transducer development for magnetic recording tape applications and on storage technology comparisons within the 'Cloud.'

In 1996 he was elected Fellow of the IEEE *“for development of novel processes for magnetic devices, most notably magneto-resistive thin film heads.”* Other IEEE recognition include the Cleo Brunetti Award (2000) and the IEEE Magnetics Society Achievement Award (2005). Bob was elected a member of the US National Academy of Engineering in 2002.

Bob joined the IEEE Magnetics Society in 1975 when he began his professional career working in the area of magnetic bubble memory. He was elected to four terms on the Society's Administrative Committee. He served in society officer positions, including President in 2001-2002. He was involved with many Magnetics Society conferences, including as general chair of the Magnetism and Magnetic Materials (MMM) Conference in 1996 and the Joint INTERMAG/MMM Conference in 2004.

Importantly, Bob served as a member and then chair of the

Society's Conference Executive Committee (CEC) during 1994-1998. Bob established two CEC subcommittees, an INTERMAG Europe Committee and an INTERMAG Asia Committee. This change opened access to more non-North-American conference cities because the Society no longer had to rely on the presence of local magnetics communities. The change also acknowledged the impact of Asia in magnetics technology and allowed Asian countries to host INTERMAG on an equal basis with Europe. These actions were aligned with IEEE's strategic imperative for globalization.

Also during this period, Bob renegotiated sponsorship of the triennial Joint INTERMAG/MMM Conference with the American Institute of Physics to make the collaborative financial arrangement, in place since 1976, more equitable and self-sustaining. The new agreement has allowed the Joint Conference to continue to offer a valuable venue for interdisciplinary magnetic interactions.

ICM 2018 in San Francisco to Host Néel Medal Award Ceremony

Submitted by Liesl Folks, ICM 2018 Secretary General

A highlight of the upcoming ICM 2018 meeting in San Francisco (July 15-20, 2018) will be the formal recognition of the recipients of the 2018 IUPAP Magnetism Award and Néel Medal.

The recipients are:

Dr. Samuel D. Bader, Argonne National Laboratory *“for outstanding and sustained experimental contributions to the field of magnetic surfaces, films, and nanostructures.”*

Prof. Ramamoorthy Ramesh, University of California, Berkeley *“for groundbreaking discoveries in novel multiferroic and magnetoelectric materials and their applications in future technologies.”*

Prof. Kang L. Wang, University of California, Los Angeles *“for the discovery of chiral Majorana fermions and outstanding contributions to topological spintronics.”*

Each of the awardees will deliver a plenary talk at the conference.

Established in 1991, the IUPAP Magnetism Award is made in recognition of outstanding contributions to fundamental and applied magnetism. It is presented every three years at the International Conference on Magnetism (ICM).

The Néel Medal is awarded together with the Magnetism Award, since 2003, sponsored by CNRS and Institut Néel. A monetary award for the winner(s) is generously sponsored by Elsevier.

IEEE Magnetics Society Administrative Committee: Call for Nominations

By **Bruce Terris**, Nominations Committee Chair

Deadline for submissions: June 15, 2018

The Administrative Committee (AdCom) of the IEEE Magnetics Society includes 24 members who are elected directly by the Society membership. Eight of these members are elected in the each year to serve a three-year term that begins at the start of the following calendar year. Membership in the IEEE and in the Magnetics Society or in an Affiliate Society is required.

The responsibility of AdCom is to manage the operations and functions of the Society. These include the publications of the Society, the conferences sponsored by the Society, the various Society awards, and the promotion of the general interests of the Society members. More details on AdCom functions may be found in the Constitution and Bylaws of the Society posted on the [Society Web site](#).

The IEEE Magnetics Society Nominations Committee seeks nominations of outstanding members of the Society to be considered for inclusion on the ballot for election to the AdCom. These nominees will be considered for inclusion on the September 2018 ballot for AdCom for the 2019-2021 term.

Nominations will be accepted from the general membership. Self-nominations are welcome and encouraged! The deadline for the receipt of nominations is **June 15, 2018**. All nominations are to be submitted online as described at the end of this article. To be guaranteed a place on the ballot, candidates may also be nominated by petition. For nominations by petition, a list of 60 (or more) petitioners' names, IEEE membership numbers, and original petition signatures must be sent separately to the Nominations Committee Chair. See further information below.

For nominations other than self-nominations, the nominator MUST verify that the prospective nominee is willing to stand for election if selected and work closely with the nominee to obtain the required information in the proper format.

The required nominee data are (a) family (last) and (b) given (first) names, (c) IEEE membership number, (d) email address, (e) telephone number, (f) affiliation, (g) country, (h) Biographical Statement (written in the third person), and (i) Statement of Candidacy (written in the first person). Each statement must be in English and be 1200 or fewer characters in length.

Required nominator data (except for self-nominations) are: (a) full name, (b) IEEE number, (c) e-mail address, (d) affiliation, and (e) an optional list of names, IEEE membership numbers and affiliations for additional endorsements of the nomination (limited to 400 characters). For self-nominations, please enter "SELF NOMINATION" in the nominator name block.

Both the nominee and the nominator MUST be current members of the IEEE and of the Magnetics Society or be a Society Affiliate as defined in the IEEE rules. The provided IEEE member number of the nominee will be taken as his/her agreement to stand for election if selected by the Nominations Committee and to serve if elected.

The Nominations Committee makes no guarantee that a nominated person will be included on the ballot. The Committee will select a minimum of 12 names (as required by the Bylaws) and likely no more than 16 names to assemble a ballot that reflect the global nature of the Society. Criteria will include factors such as technical accomplishment, professional honors, leadership, and past service to the Society. The eight individuals with the largest number of votes will become the elected AdCom members for the 2019-2021 term. The election will be administered by the IEEE and will be held from mid-August to mid-October 2018.

IEEE rules also allow for nomination by petition by 2% of the membership of the Society for automatic inclusion on the ballot. Based on the current membership (around 3000, as of November 2017), 60 valid signatures are required for a nomination by petition. The nomination process is the same, except that the list of petitioner names, IEEE membership numbers, and original signatures must be submitted in hard copy to the Chair of the Nominations Committee on or before June 15, 2018. FOR NOMINATION BY PETITION SIGNATURE LISTS ONLY, SEND MATERIALS TO: Bruce Terris, IEEE Magnetics Society Nom. Com. Chair, Western Digital, 5601 Great Oaks Pkwy, Bldg. 50/B2, San Jose CA 95119 USA.

All nominations shall be submitted on or before June 15, 2018 via <http://www.ieeemagnetics.org/nominations.php>

Nominators are urged to collect and check the required materials BEFORE going to the online nomination form, and to carefully proofread the entered fields BEFORE final submission. Once submitted, there is no provision for edits or corrections. For those nominations selected for the ballot, the Biographical Statement and Statement of Candidacy will be included on the ballot as submitted.

Questions should be sent by e-mail to: bruce.terris@ieee.org. The members of the Nominations Committee are listed below. These individuals may also be contacted for additional information (click the names to send an email):

Adekunle Adeyeye, Atsufumi Hirohata, June Lau, Sara Majetich, Stephane Mangin, John Moreland, and Te-Ho Wu.

Thank you for your support of the IEEE Magnetics Society through your membership and your participation in this process.

UK & Ireland Chapter News

Submitted by Nicola Morley, Chapter Chair and Paul Nutter, Chapter Secretary

The IEEE Wohlfarth Lecture and the Annual General Meeting (AGM) of the IEEE Magnetics Society UK & Ireland Chapter took place at **Magnetism 2018** in Manchester, UK during April 9-10, 2018.

In its fifth year, and returning to Manchester for the first time since the inaugural conference in 2014, **Magnetism** serves as a forum for researchers in magnetism and magnetic materials from across the UK and the Republic of Ireland, to present their latest research and network with other researchers.

This year the conference had a larger international contingent, with researchers attending from Europe, USA and Asia. It was attended by over 200 delegates, approximately 90 of whom were students. The conference was held over two days with 50 oral presentations, of which 7 were invited, including presentations from three of the 2018 IEEE distinguished lecturers: YoshiChika Otani (University of Tokyo, Japan), Alison Flatau (University of Maryland, USA), and Mitsuteru Inoue (Toyohashi University of Technology, Japan).

The highlight of the first day was a plenary lecture by Nobel Laureate Albert Fert (University of Paris-Sud, France) who discussed how topology and spin-orbit coupling in low dimensions lead to new directions in spintronics and gave a memorable demonstration of topologically protected structures.

The conference banquet was then held at the impressive 4-star Grade II* listed Midland Hotel, with an after-dinner talk by Brian Tanner (Durham University, UK) who discussed his experiences dating back to 1978 in the commercial spin out of academic research. He encouraged the audience to consider taking the roller-coaster of creating a spin-out company.

Gino Hrkac presenting the 2018 Wohlfarth Lecture.



Society Distinguished Lecturers YoshiChika Otani and Mitsuteru Inoue enjoying the poster presentations at Magnetism 2018.

The highlight of the second day was the presentation of the 2018 Wohlfarth Lecture, a prestigious annual seminar given by a rising star within the worldwide magnetism community. The Wohlfarth Lecture is given in recognition of the outstanding contribution to the field of magnetism made by Peter Wohlfarth and is co-sponsored by the Society's UK & Ireland Chapter and the Institute of Physics **Magnetism Group**.

This year's recipient was Gino Hrkac (University of Exeter, UK). Prof. Hrkac described his main research areas, including modelling of Nd-Fe-B magnets for hybrid cars and understanding the coupling between a perpendicular magnetic layer (CoPd) and a soft magnetic layer (NiFe) using micromagnetic modelling and experiments. Prof Hrkac demonstrated how modelling can be used to predict behaviour in magnetic materials, and how this knowledge can be used to help with material design.

A poster session ran throughout the conference with over 90 posters on display, with a best poster competition aimed at student presenters. Poster prizes were awarded to: Natalie Whitehead (University of Exeter, UK) (winner), Ben Nicholson (University of Durham, UK) (runner-up), Camilla Buhl Larsen, (University of Birmingham, UK) (runner-up), Charlotte Bull (University of Manchester, UK) (highly commended) and Joel Barker (Paul Scherrer Institut, Switzerland) (highly commended).

The conference was supported by four sponsors: Durham Magneto-optics Ltd, Zurich Instruments, Oxford Instruments and the UK EPSRC-funded CCP on computational magnetism. The conference also hosted eleven exhibitors demonstrating state-of-the-art instrumentation for magnetics research.

At the Society's UK & Ireland Chapter's AGM, the following new committee members were elected: Chair, Nicola Morley (University of Sheffield, UK); Secretary, Nina-Juliane Steinke (STFC Rutherford Appleton Laboratory, UK); and Treasurer, Paul Nutter (University of Manchester, UK).

INTERMAG 2018: Conference Report

By S. N. Piramanayagam, Conference General Chair

INTERMAG 2018 was held during April 23-27, 2018 at the Marina Bay Sands Expo and Convention Centre in Singapore. The conference attracted more than 1400 participants, 30 exhibitors, one Gold sponsor, three Silver sponsors and several other sponsors.

Approximately 1600 papers were presented in 70 oral and 57 poster sessions, and the conference program included nine symposia, 103 invited speakers and special Tuesday and Thursday evening sessions.

Numerous awards were presented during the Plenary Session. For the first time at InterMag, there was an 'Art in Magnetism' display with eight entries, shortlisted from 35 entries from around the globe. Four awards were given, based on judges' decision and popularity.

Overall, all the participants had nice things to say about the venue, food, organization and quality of the presentations.

INTERMAG 2018: Plenary Session

By Burkard Hillebrands, Honors and Awards Committee Chair

This year, the plenary session of the INTERMAG 2018 Conference in Singapore was held on April 25, 2018 at the Sands Expo & Convention Centre in Marina Bay Sands. It was the central event of the conference, giving the participants the opportunity to gather together, to participate in IEEE Magnetics Society activities such as the award ceremony and the plenary lecture, and to meet afterwards at the conference dinner.

The plenary session was opened by the Conference General Chair Sara Majetich (Carnegie Mellon University, USA). She welcomed the audience, also in the name of the second General Chair S. N. Piramanayagam (Nanyang Technological University, Singapore) and the Local Chair, Raju Ramanujan (Nanyang Technological University, Singapore). Prof. Majetich presented the venue, Singapore, which is one of the leading economic centers of Southeast Asia. Among others, she showed viewgraphs of the city skyline, the 'Merlion', a mythical creature being a mixture between a lion and a mermaid and the unofficial mascot of Singapore, the Garden of the Bay, and, very importantly, the Marina Bay Sands Hotel complex with its superb architecture, which hosted the conference.

Next, Prof. Majetich introduced the conference committee and the volunteers who made the conference such a success. The conference committee comprised Albrecht Jander, Jingsheng Chen, Shigeki Nakagawa, and Johannes Paulides (Program Chairs), Mark T Kief and Lew Wen Siang (Treasurers), Petru Andrei and Dan Wei (Publication Chairs), Atsufumi Hirohata,



Young Keun Kim, and Hyunsoo Yang (Exhibit Chairs), Philip Pong (Publicity Chair), Vivian Ng (Student Awards), Adekunle Adeyeye (Student Travel), Rudi Schaefer (IEEE Representative), and Diane Melton and Cheng Hoon Khoo (Society Support). She also thanked all members of the program committee and the publication editors. 165 session chairs including co-chairs ensured a smooth operation. The audience thanked them all for their hard work with a big round of applause.

2054 abstracts from all around the world had been submitted and reviewed. 103 invited and 1497 regular presentations (oral and posters) were accepted from 46 countries.

Before the award presentations began, an important contributor to the field of magnetism, who recently passed away, was remembered. This was **Peter Grünberg** (1939 – 2018), who, together with Albert Fert, was awarded the Nobel Prize in Physics in 2007 for the discovery of giant magnetoresistance.

The Honors and Awards Chair guided through the awards part of the session. The IEEE Magnetics Society Achievement Award is awarded every year to a Magnetics Society member who has made extraordinary contributions to the field of magnetism. Previous recipients have included such distinguished scientists, engineers and managers as Floyd Humphry, Emerson Pugh, Bill Doyle, H. Neal Bertram, Isaak Mayergoyz, John Slonczewski, Michael L. Mallery, Randall H. Victora, Takao Suzuki, Luc Berger, and William H. Butler, who received last year's award. This award is the highest honor bestowed by the Society.

This year's recipient was **Roy Chantrell** (University of York, UK). The citation reads "For contributions to the theory of interacting spin systems and application to the understanding of magnetic recording media and ultrafast magnetization processes." The award, consisting of a certificate, a \$3000 cash award, a travel allowance and life membership in the Society, was presented by Society President Manuel Vázquez.



Roy Chantrell (center) receives the Achievement Award from the President of the Society, Manuel Vázquez (right).

O’Grady (University of York, UK) “for advancing international participation and inclusive representation in the IEEE Magnetics Society.” The award consists of a certificate, a \$2000 cash award, a travel allowance and life membership in the Society. The award was presented by Society President Manuel Vázquez.

In 2018 one member of the Society was elevated to the grade of IEEE Fellow, and he was presented next. The IEEE Grade of Fellow is conferred by the Board of Directors of the IEEE upon a person with an extraordinary record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year does not exceed one-tenth of one percent of the total voting institute membership. The new Fellow is **Hideo Ohno**, (Tohoku University, Japan), “for contributions to materials and device design for spintronics.”

The newly established Early Career Award was presented for the second time. The IEEE Magnetics Society has established this award in order to better support researchers in the early period of their career. This award will be given to an individual, nominated no more than five years after the completion of his or her PhD, and who has already shown outstanding scientific or technical achievements which are significantly beyond the average performance of a person at that career level.

The Early Career Award consists of a cash award of US\$ 1500, a travel award of US\$ 500 and life membership in the Society. This year’s recipient was **Anjan Soumyanarayanan** (Data Storage Institute, Singapore) “For contribution to tailoring interfacial interactions to generate and manipulate room temperature topological spin structures.”

In 2016 the IEEE Magnetics Society Distinguished Service Award was established to honor outstanding service to the Society. Recipients are characterized by sustained voluntary service significantly beyond the typical activities. This award was first presented to Ron Goldfarb (NIST, USA) in 2016 and last year to Robert E. Fontana, Jr. (IBM, USA). At this conference, it was awarded for the third time. This year’s recipient was **Kevin**



Anjan Soumyanarayanan (center) receives the Early Career Award from the President of the Society, Manuel Vázquez (right).

Next, the Honors and Awards Committee Chair thanked the 2017 Distinguished Lecturers for the work that they did in the past year giving lectures all around the world, and he presented them with Certificates of Appreciation. They were **Michael Farle** (University of Duisburg-Essen, Germany), **Xiaofeng Jin** (Fudan University, China), **Hendrik Ohldag** (SLAC, USA) and **Eiji Saitoh** (Tohoku University, Japan).

The Honors and Awards Chair thanked **Nora Dempsey**, Chair of the 2017 INTERMAG conference in Dublin, Ireland, for organizing an exciting and very successful conference.

It is a good tradition to thank those members of the Society’s Administrative Committee who are rotating off. They were called on the stage, where they were presented with Certificates of Appreciation. Outgoing AdCom members were **Franka Albertini**, **Bernard Dieny**, **Ming Cheng**, **Dafine Ravelosona**, **Alexandru Stancu**, **Jian-Ping Wang**, and **Roger Wood**.

Each year the IEEE Magnetics Society sponsors a summer workshop for students, where some 90 students attend a five-day workshop given by some of the best scientists working in in



Kevin O’Grady, recipient of the Distinguished Service Award during his recipient remarks.

the field of magnetism. This program is run by the Education Committee. Last year, the workshop was held in Santander, Spain, organized by **J. M. Barandiaran**. The Honors and Awards Chair thanked him for another excellent workshop.

New at this conference was the Art in Magnetism contest. The Program Chair, Albrecht Jander, had asked for the best artistic figures or diagrams. A shortlist of the best submissions was evaluated by a group of judges as well as by popular choice. Winners in the Judges' Selection category were 'Information Dispersion,' submitted by **Taro Fukazawa** (National Institute of Advanced Industrial Science and Technology, Japan), showing the calculated spin-wave dispersion for SmFe_{12} , and 'Hygeia's Gift: A Tranquil World,' submitted by **Donghui Wang** (Wuhan University, China), showing an SEM image of metal foam.



The plenary speaker, Hideo Ohno (Tohoku University, Japan).

In the People's Choice category the winners were 'Masked Mushroom' submitted by **Riccardo Bertacco** (Politecnico di Milano, Italy) with an SEM image of structure from pores overfilled by Ni electroplating, and 'My Nano Sunflowers,' submitted by **Matteo Cialone** (Istituto Nazionale di Ricerca Metrologica, Italy) showing a colored SEM image of sub-micrometer structures of $\text{Fe}_{70}\text{Pd}_{30}$. The images can be seen on Page 9, and the winning images will appear on the front page of forthcoming issues of the Newsletter (starting with this one).

Next, the Honors and Awards Committee Chair introduced the 2018 Best Student Presentation Award winner and the other finalists. Six students were selected as finalists following the submission of abstracts to the conference and review of their applications, based on the likely quality and impact of their work. The winner was **Mohammad Zahedinejad** (University of Gothenburg, Sweden) with his presentation 'Mutually



From left to right: Honors and Awards Chair Burkard Hillebrands, and retiring AdCom members Jian-Ping Wang, Franka Albertini, and Bernard Dieny.

synchronized 2D spin Hall nano-oscillator arrays.' He received a certificate and a \$1500 cash award. The other finalists were **Jérémy Létang** (University of Paris-Sud, France), **Hiroki Taniguchi** (Osaka University, Japan), **Mario Fratzl** (Institute Néel, France), **Dédalo Sanz-Hernández** (University of Cambridge, UK) and **Xueying Zhang** (Beihang University, China). They all received a certificate and a \$250 cash award.

As part of its commitment to keeping the field of magnetism vibrant, the IEEE Magnetics Society provides travel grants for students to attend conferences sponsored by the Society. Generally, these are students in doctoral or masters programs within a year or so of graduating. Their vitality and enthusiasm brings a fresh perspective to the conference, and the students are given a chance to learn more about how conferences and publications feature into being a professional scientist or engineer. This year, 16 travel grants were awarded.

The highlight of each Plenary Session is the Plenary Lecture. **Hideo Ohno** (Tohoku University, Japan), gave an exciting and well received lecture on 'Spintronic Nanodevices.'

Following the Awards Ceremony, the conference attendees met at the Conference Dinner and used the opportunity for discussions and exchange.



The winners of the Art in Magnetism contest. From left to right: Burkard Hillebrands (Honors and Awards Chair), Donghui Wang, Riccardo Bertacco, Matteo Cialone, Taro Fukazawa, and Albrecht Jander (Chair of the contest).

INTERMAG 2018: Student Travel Grant Reports

Submitted by Burkard Hillebrands, Honors and Awards Committee Chair

Each recipient of a student travel grant award from the IEEE Magnetics Society for INTERMAG 2018 was asked to write a brief summary of their conference experience. The following are extracts from the summaries written after the INTERMAG 2018 Conference in Singapore.

* * *

"The INTERMAG 2018 conference in Singapore was the third INTERMAG that I visited and it was again a great experience. I'm impressed every time by the research of this large community and the wide range of topics. Attending this conference gave me the opportunity to meet other experts and to learn from their research. I'm grateful to the organizers and to the IEEE Magnetics Society for the travel grant."

-- Coen Custers
Eindhoven University of Technology, The Netherlands

"I would like to thank the Magnetics Society for the opportunity to disseminate my research, and to discuss results with worldwide researchers and industrial partners in topics related with magnetism and sensors. Furthermore, INTERMAG 2018 was an enriching experience with a broad range of subjects, which will help my investigation in order to reach my goals."

-- Fernando Franco
INESC Microsystems & Nanotechnologies, Portugal

"I am grateful to the IEEE Magnetics Society and the conference organizers for the travel grant allowing me to participate at INTERMAG 2018 in Singapore. I had the opportunity to present my work to a broader public and attended some excellent oral presentations and posters. Discussions with my peers and with renown researchers from industry and academia allowed me to deepen my understanding of magnetism and provided me with inspiration to advance my own research."

-- Mario Fratzl
Institut Néel & G2Elab, Université Grenoble Alpes, France

"Thank you very much for the opportunity to travel to Singapore to attend the INTERMAG conference and to discuss with experts from academics and industries about current research in the fields of magnetism. Through this exciting experience I could see the work done by world leaders in magnetism and obtain many new ideas and advice from experts around the world."

-- Taehyun Kim
*Information Devices and Materials Laboratory
Korea University, Korea*



Student Travel Grant recipients with Society President, Manuel Vázquez, and Honors and Awards Chair, Burkard Hillebrands

"Participation in conferences allows us to learn about the recent advanced results in the area of our research. This contributes to the effective development not only our research, but also to the whole scientific community. INTERMAG is one of the best conferences on magnetism. It was an honour for me to participate. I would like to thank the IEEE Magnetics Society for the opportunity to attend."

-- Aleksandr Kolesnikov
Far Eastern Federal University, Vladivostok, Russia

"It was a good journey for me to participate in INTERMAG 2018. Both oral and poster presentations gave me good inspiration in my research field. Besides, it gave me a chance to communicate with the experts and researchers in my field. Although the journey on the road is laborious, this experience will be valuable in my future study. Finally, I really appreciate the student travel award from the IEEE Magnetics Society."

-- Xiaomei Liu
Southeast University, China

"It was my pleasure to attend INTERMAG 2018, Singapore. I enjoyed the conference environment, presentations and excellent organization. It was a great opportunity to attend this Society event and to meet clever scientists from all around the world. INTERMAG covers a wide range of topics in physics and engineering for magnetism, which makes it a first-rate event for students. I would like to say my many thanks to the IEEE Magnetics Society for their efforts and travel grant award."

-- Mehran Mirzaei
Czech Technical University, Czech Republic

"We have few platforms that give the opportunity for the world's magnetic-research community to come together to share their innovations, thoughts and free and fair criticisms. INTERMAG 2018, Singapore, was one of the best. The Plenary Lecture by Professor Hideo Ohno left a deep mark that will inspire us to work hard on new smart magnetic devices. I also have to mention the 'Meet the Experts' session with Professor Kevin O'Grady. I am also thankful to the Society for their support

and I look forward to future INTERMAG conferences."

-- Himadri Roy Dakua
IIT Bombay, India

"I would like to greatly thank the IEEE Magnetics Society for helping me attend INTERMAG 2018. Taking part in the great oral and poster sessions, having the opportunity to present my research, and speaking to leading experts in the field have all been invaluable experiences."

-- Dédalo Sanz-Hernández
University of Cambridge, UK

"It was a great honor for me to receive the IEEE Magnetics Society Student Travel Award. I was deeply impressed by INTERMAG 2018 Singapore. I made two oral presentations, attended the poster sections and met many experts during the conference. I exchanged academic ideas with experienced professors and peer students. I gained a lot from them. Thanks again to the IEEE Magnetics Society for giving me such a valuable opportunity to broaden my mind."

-- Yunyi Jiang
Nanjing University of Aeronautics and Astronautics, China

"Participating in INTERMAG 2018 was a great experience to me. Fortunately, I had the opportunity to present my paper. Through discussions with researchers from different countries, I discovered many good ideas. In addition, I am grateful to the IEEE Magnetics Society for giving me the student travel grant and inviting me to attend INTERMAG 2018. It gives me a chance to see the best researchers of the world and obtain much inspiration for my future research."

-- Kuan Yang
National Sun Yat-sen University, Taiwan

INTERMAG 2018: Best Student Presentation Finalists

By Burkard Hillebrands, Honors and Awards Committee Chair

The winner of the Best Student Presentation Award was selected at the INTERMAG Conference 2018 in Singapore. All presentations were excellent, and the finalists contributed papers of great interest to the conference attendees.

Congratulations to the finalists and the winner!

The winner was **Mohammad Zahedinejad** (University of Gothenburg, Sweden) with his presentation titled 'Mutually synchronized 2D spin Hall nano-oscillator arrays'. He received a certificate and a \$1500 cash award. The other finalists received a certificate and a \$250 cash award and were:

- **Jérémy Létang** (University of Paris-Sud, France)
Title: Modulation of chaotic nanocontact vortex oscillators;



Best Student Presentation finalists with Education Chair, Atsufumi Hirohata.

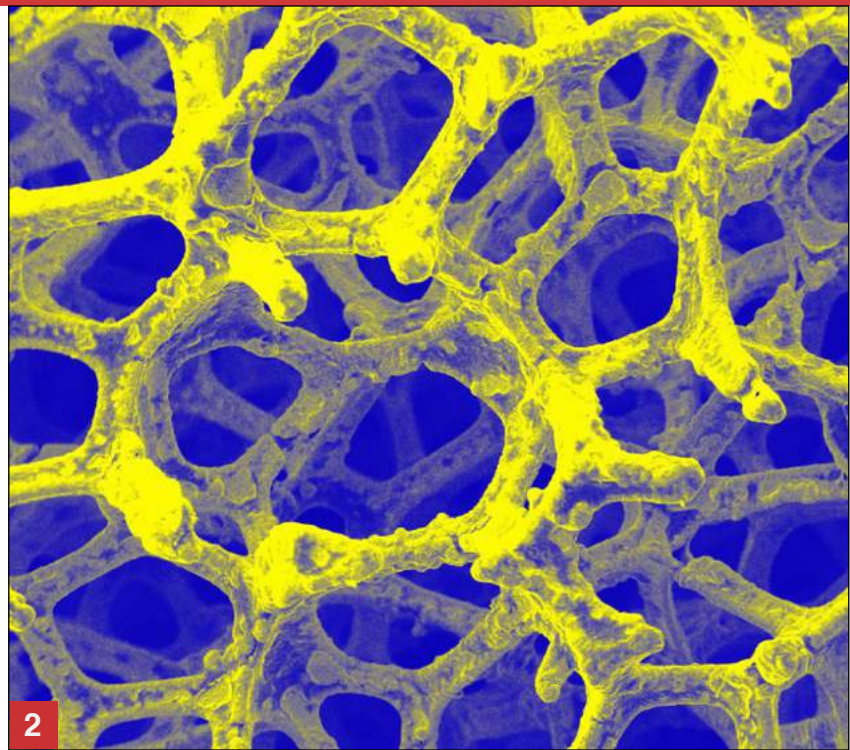
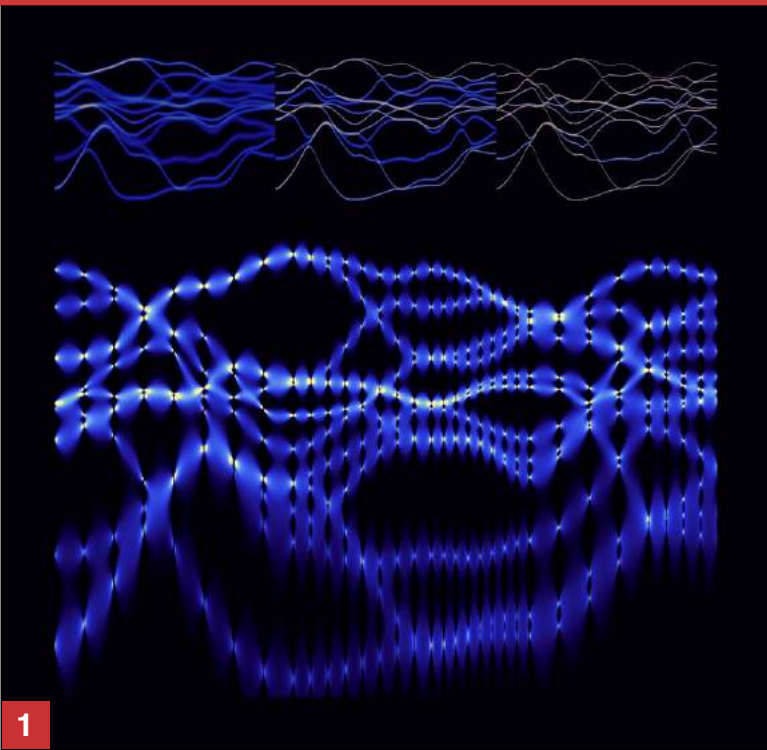
- **Hiroki Taniguchi** (Osaka University, Japan)
Title: Strong suppression of spin Hall effects induced by spin fluctuations;
- **Mario Fratzl** (Institut Néel, France)
Title: Magneto-paper composites for low-cost two-way valves and other active μ Pads;
- **Dédalo Sanz-Hernández** (University of Cambridge, UK)
Title: Information transfer and trapping in a 3D nano-printed domain-wall conduit; and
- **Xueying Zhang** (Beihang University, China)
Title: Direct observation of domain wall surface tension by deflating or inflating a magnetic bubble.



Mohammad Zahedinejad receives his certificate for Best Student Presentation from the Education Chair, Atsufumi Hirohata.

The Newsletter Gets a Makeover

You may have noticed that this issue of the Newsletter sees a new style and layout. The goal of the change is to give the Newsletter a fresh, updated look. Let us know what you think by emailing the [Newsletter Editor](#).



INTERMAG 2018: Art in Magnetism Contest

Judges' Selection Winners:

1. *Information Dispersion*, calculated spin-wave dispersion for SmFe_{12} , submitted by **Taro Fukazawa**.
2. *Hygeia's Gift: A Tranquil World*, SEM image of metal foam, submitted by **Donghui Wang** (and on the cover of this issue of the Newsletter).

People's Choice Winners:

3. *Masked Mushroom*, SEM image of structures from pores overfilled by Ni electroplating, submitted by **Ricardo Bertacco**.
4. *My Nano Sunflowers*, colorized SEM image of sub-micron structures of $\text{Fe}_{70}\text{Pd}_{30}$, submitted by **Matteo Cialone**.

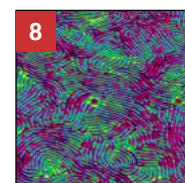
Other Finalists:

5. *Crystal Canyon*, film of small molecules solution processed on top of a metallic ferromagnetic thin film, submitted by **Angela Wittmann**.

6. *Easter Eggs on a Sandy Beach*, AFM image of PS-PDMS di-block copolymer on a Si/SiO_2 substrate, submitted by **Durgesh Kumar**.

7. *Ratchet Made of Tiny Magnets*, micromagnetic field simulation of functional material based on coupled nanomagnets, submitted by **Sebastian Gliga**.

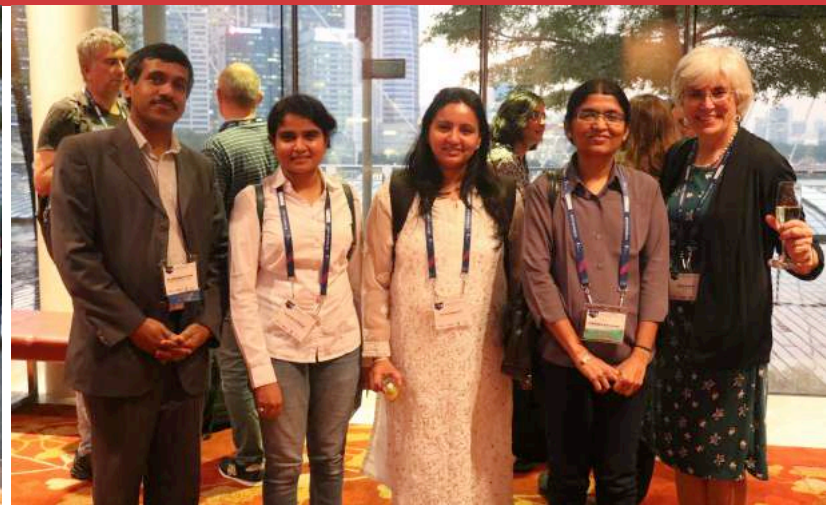
8. *Fingerprints In a Starry Night*, partial micro-phase separation between PS and PDMS copolymers, submitted by **Bhatti Sabpreet**.



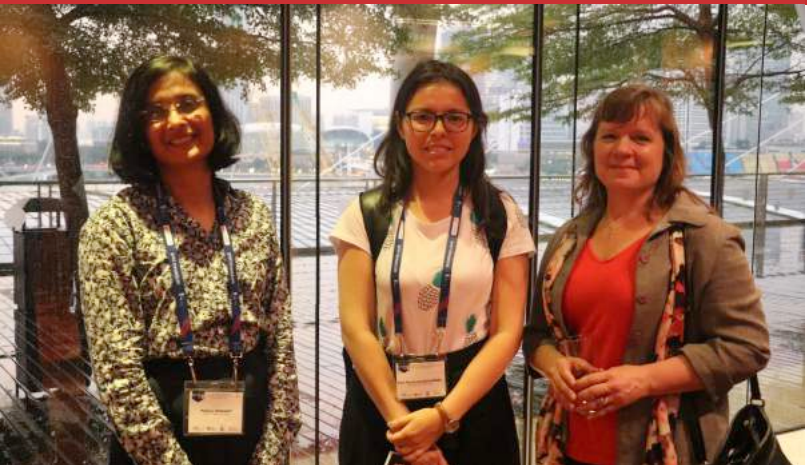


INTERMAG 2018: In Pictures - Conversations





INTERMAG 2018: In Pictures - Socializing





INTERMAG 2018: In Pictures - Conference Dinner





INTERMAG 2018: In Pictures - Cultural Programme





TMRC 2018 Registration Now Open

By Tiffany Santos, TMRC 2018 Publicity Chair

Registration: Registration is now open for the 29th Magnetic Recording Conference (**TMRC 2018**), to be held during August 8-10, 2018 in Milpitas, California, USA. A discounted registration fee is available until **July 16, 2018**. Register now via this link: <http://www.cvent.com/d/ytqtcr>.

Accommodations: Hotel reservations are available at Crowne Plaza San Jose - Silicon Valley, located across the road from the conference site. A special TMRC reservation rate is available until **July 16, 2018**. Make your reservation now via this link: <https://book.passkey.com/go/WesternDigitalTMRC2018>.

Second Call for Posters: The focus of TMRC 2018 is novel materials, devices and technologies for magnetic data storage and advanced applications, and the topics are listed below. Please view the **Call for Posters**, and submit your poster abstracts via email to the Poster Co-Chairs by **May 25, 2018**.

Poster abstracts should be 1-2 pages and follow the template provided on the TMRC 2018 website. Accepted abstracts will be included in the TMRC Digest Book, and poster contributors are encouraged to submit a manuscript for publication in *IEEE Transactions on Magnetics* following peer review.

Topics of interest include:

- Advanced Magnetic Recording for > 2 Tbits/in² including Readers, Writers, Servo, Tribology, HDI, Signal Processing;
- Heat Assisted Magnetic Recording (HAMR System, Head/Media and HDI);
- Microwave-Assisted Magnetic Recording (MAMR);
- Alternative Magnetic Recording Technologies (SMR, TDMR, HIMR, Heated-dot, Tape, All Optical Switching);
- Spin Transfer Torque-Magnetic Random Access Memory (MTJ cell, MRAM chip, manufacturing and roadmap);
- MRAM & Magnetic Logic – New Physics & Materials (MRAM architecture, VC-MRAM, SOT-MRAM, TI & 2D materials); and
- Fundamentals (Metrology, Tooling, Materials, Recording Physics)

TMRC 2018 is sponsored by the IEEE Magnetics Society and co-sponsored by the Data Storage Systems Center (Carnegie Mellon University, USA), the Center for Memory and Recording Research (University of California, San Diego, USA), the Center for Micromagnetics & Information Technologies (University of Minnesota, USA), the Center for Materials for Information Technology (University of Alabama, USA), the Center for Magnetic Nanotechnology (Stanford University, USA) and the Computer Mechanics Laboratory (University of California, Berkeley).

Conference Calendar

By **Gareth Hatch**, Newsletter Editor

5th International Conference of Asian Union of Magnetics Societies (IcAUMS2018)

June 3-7, 2018 - Jeju, Republic of Korea

2018 IEEE Magnetics Society Summer School

June 3-8, 2018 - Quito, Ecuador

8th International Conference on Magnetism and Metallurgy (WMM 2018)

June 12-14, 2018 - Dresden, Germany

2018 IEEE International Conference on Microwave Magnetics (ICMM 2018)

June 24-27, 2018 - Exeter, UK

12th European Magnetic Sensors and Actuators Conference (EMSA 2018)

July 1-4, 2018 - Athens, Greece

9th International Conference on Highly Frustrated Magnetism (HFM 2018)

July 9-14, 2018 - Davis, California, USA

21st International Conference on Magnetism (ICM 2018)

July 15-20, 2018 - San Francisco, California, USA

29th Magnetic Recording Conference (TMRC 2018)

August 8-10, 2018 - Milpitas, California, USA

25th International Workshop on Rare-Earth and Future Permanent Magnets and their Applications (REPM 2018)

August 26-30, 2018 - Beijing, China

16th International Conference on Molecule-based Magnets (ICMM2018)

September 1-5, 2018 - Rio de Janeiro, Brazil

Joint European Magnetic Symposia (JEMS 2018)

September 3-7, 2018 - Mainz, Germany

18th Biennial Conference on Electromagnetic Field Computation (CEFC 2018)

October 28-31, 2018 - Hangzhou, China

Asia-Pacific Magnetic Recording Conference 2018 (APMRC 2018)

Nov 9-15, 2018 - Shanghai, China

2019 Joint MMM-Intermag Conference

January 14-18, 2019 - Washington, District of Columbia, USA

2020 Conference on Magnetism and Magnetic Materials (MMM 2019)

Nov 4-8, 2019 - Las Vegas, Nevada, USA

To list your conference in the Newsletter Conference Calendar, please contact the **Newsletter Editor**.

Forthcoming Revision of the International System of Units Will Affect Magnetics

By *Ron Goldfarb*, Chief Editor, *IEEE Magnetics Letters*

It is very likely that the International System of Units (SI) will be revised in 2019 such that the value of the permeability of vacuum will no longer be exactly equal to $4\pi \times 10^{-7}$ H/m. This will mean that quantities will no longer be exactly convertible between SI and the centimeter-gram-second system of electromagnetic units (EMU).

The reasons for the revision and its philosophical implications are discussed in my recent editorial in *IEEE Magnetics Letters*, available at:

<http://dx.doi.org/10.1109/LMAG.2017.2777782>

About the Newsletter

The purpose of the Newsletter of the IEEE Magnetics Society is to publicize activities, conferences, workshops and other information of interest to Society members and other people in the area of applied magnetics.

Contributions are solicited from Society members, Officers & other volunteers, conference organizers, local chapters, and other individuals with relevant material. The Newsletter is published quarterly on the Society webpage at: <http://www.ieeemagnetics.org>

Please send all contributions via email to the Newsletter Editor, Gareth Hatch, at: g.p.hatch@ieee.org

Information contained in this newsletter may be copied without permission provided that copies for commercial advantage are not made or distributed, and the title of the publication and its date appear on each copy.